Final script from "Adult Immunization Update" satellite broadcast, June 26, 2003.

Influenza segment.

The next two vaccine preventable diseases we are going to discuss are influenza and pneumococcal disease. Influenza and pneumococcal disease are the most common cause of vaccine preventable death in the United States. New estimates are that influenza alone kills an average of 36,000 Americans every year. Ninety percent of these deaths occur among adults 65 years of age and older. In addition, about 3,400 adults 65 and older die from pneumococcal disease each year – mainly from bacteremia, meningitis, and pneumonia. The number of deaths and cost to society from these diseases are likely to increase as the nation's population ages. The U.S. Census Bureau projects that the number of adults 65 and older will double during the next 30 years.

New estimates also indicate adults 85 and older may be 32 times more likely to die of influenza complications than people 65 to 69 years of age. The Census Bureau reports that the number of persons 85 and older doubled between 1976 and 1999. Immunizations can reduce the risk of getting influenza AND the severity of illness, while saving money for society.

Let's look at influenza vaccine and recommendations for vaccination. In order to understand influenza vaccine, it's helpful to know a little about influenza virus.

There are two major types of influenza virus – A and B. Type A causes moderate to severe illness in all age groups. Type B generally causes milder epidemics and primarily affects children.

Two antigens on the surface of influenza virus – hemagglutinin and neuraminidase help the virus infect cells in the respiratory tract. Antibodies against these antigens result in immunity to infection. But these antigens change with time. These changes allow the virus to evade our immune response to prior influenza infection. The result is that we can experience repeated infections with influenza viruses during our lifetime.

There are basically two types of antigenic changes that

influenza viruses undergo, drift and shift. Antigenic drift is a relatively minor change within the subtype. Antigenic drift may be associated with epidemics, depending on how different the new virus is from the prior virus. Drift occurs continually from year to year, or even within the same year. Antigenic shift is a major change that creates a new subtype. This new subtype usually replaces its predecessor. This type of change is associated with pandemics, or world wide epidemics, because the entire population of the world is susceptible to this new virus.

Antigenic shift doesn't happen frequently, but when it does, hundreds of thousands, or millions, of deaths may result. In the last century, five antigenic shifts occurred, every 10-30 years. The last major shift was in 1968, more than 30 years ago. There is no question that influenza virus will shift again. The question is WHEN the shift will occur. We hope that by developing a pandemic preparedness plan we will be ready for the next shift.

Because influenza viruses change continually, and sometimes change radically, we may experience influenza illness more than once, and the vaccine components may need to be changed annually. Fortunately, only a few strains of virus circulate at any given time. For the last twenty years, only two type A's and one type B have circulated concurrently. That makes vaccine production a little easier.

Influenza vaccine has been available in the United States for more than 50 years. Until 2003, all influenza vaccine available in the U.S. was inactivated vaccine. Although a live attenuated influenza vaccine will be available beginning in the 2003-2004 influenza season, we will still rely heavily on inactivated vaccine. We will comment on live attenuated influenza vaccine in a moment.

Inactivated influenza vaccines available in the United States contain only fragments of influenza virus. These vaccines are known as split virus or subvirion vaccines. The vaccine is trivalent – it contains 3 different viruses, two type A's and one type B. The viruses contained in the vaccine are chosen each spring, based on surveillance of currently circulating strains. The duration of immunity from influenza vaccine is considered to be one year or less. Vaccine efficacy varies depending on two factors: the recipient's age and health status and the similarity of the

vaccine viruses to the circulating viruses.

If there is a good match between vaccine and circulating strains, the vaccine is 70%-90% effective in preventing clinical illness among healthy persons less than sixty five years of age. However, it's only 30%-40% effective in preventing illness among persons 65 years of age and older who have underlying medical conditions. The REAL value of influenza vaccine is that it significantly decreases complications and death from influenza among those who get the disease.

Here's a graph that shows the percent of nursing home residents who were hospitalized, developed pneumonia, or died, during an influenza outbreak. The green bars represent vaccinated residents and the tan bars represent the unvaccinated residents. Unvaccinated residents were twice as likely to be hospitalized, more than twice as likely to develop pneumonia, and more than four times as likely to die as vaccinated residents. That's a major take away message for influenza vaccine. It doesn't prevent ILLNESS as well as we would like, but vaccinated people have milder illness and significantly fewer complications.

In June 2003 the Food and Drug Administration approved this country's first live attenuated influenza vaccine. The vaccine is called FluMist. It's administered by nasal spray rather than by injection. FluMist is likely to be available for the 2003-2004 influenza season. However, it is approved for use only among HEALTHY persons 5 through 49 years of age. It is NOT approved for persons 50 and older, or for people with medical conditions that place them at high risk of complications from influenza. ACIP has not yet published recommendations on the use of FluMist. So we will not discuss FluMist further in this program. However, we will discuss this new vaccine at length in our August Immunization Update satellite broadcast. By that time we expect to have ACIP recommendations available for the vaccine.

So who should be getting inactivated influenza vaccine? The basic strategy is to protect the people at high risk of complications by inducing active immunity in them AND in the people who come into close contact with them. And who are the people at high risk of influenza related complications? The risk factors are age, certain chronic illnesses, pregnancy, and chronic aspirin use in children.

An annual influenza vaccination is recommended for: all persons 50 years of age or older; residents of long-term care facilities housing persons with chronic medical conditions; persons who have long-term health problems, such as heart or lung disease, kidney disease, metabolic diseases like diabetes, asthma, or anemia and other blood disorders; persons with a weakened immune system due to HIV, AIDS, other diseases that affect the immune system, long-term therapy with drugs such as steroids, or cancer treatment with radiation or drugs. People 6 months to 18 years of age on long term aspirin therapy because of the risk for Reye syndrome if they are infected with influenza; pregnant women who will be past the third month of pregnancy during influenza season. The influenza season is usually November through March, but can be longer. Health care workers, family members, or anyone else who comes in close contact with persons at risk of influenza complications. An annual influenza vaccination should also be encouraged for the following groups: healthy children 6-23 months of age and household contacts and out-of-home caretakers of children two years of age and younger. This is especially true if the child is less than six months of age since the child is too young to receive the vaccine. People who provide essential community services, such as law enforcement, firefighters, and other first responders. Foreign travelers, especially those who travel to the Southern hemisphere between April and September and those who travel to the tropics or with organized groups at any time. People who live in dormitories or any type of crowded condition. And, finally, ANYONE who wants to reduce their risk of infection with influenza virus should be vaccinated.

The influenza vaccine you will be using most frequently is an inactivated vaccine. Its adverse reaction profile is like that of other inactivated vaccines. As you would expect from any inactivated vaccine, the most common adverse reactions are local reactions. In recent studies, from 15% to 20% of recipients report local reactions, like pain at the injection site. These studies also show that systemic reactions, such as fever and malaise are not common, and occur mostly in persons who have had no exposure to the influenza virus antigens in the vaccine, particularly young children. Severe allergic reactions are rare, and are most likely related to residual egg protein when they do occur. Good screening can essentially

eliminate the risk of allergic reactions in influenza vaccine recipients. Neurological reactions, specifically Guillain Barre´ syndrome, are very rare. GBS has not been clearly associated with influenza vaccine since the swine flu vaccine in 1976.

Most influenza vaccine you will use is inactivated so it cannot cause influenza. However, it is possible to get influenza AFTER vaccination. It takes a week or two to develop a good immune response to the vaccine. But since the incubation period of influenza is only three days, you could get influenza if you were exposed shortly after being vaccinated, before the vaccine has had a chance to work.

Contraindications and precautions to influenza vaccine are the same as most other inactivated vaccines. A history of a severe allergic reaction to a vaccine component or following a prior dose of vaccine is the only contraindication. Needless to say, people with anaphylactic egg allergy should not receive influenza vaccine. Moderate or severe acute illness is a precaution, and vaccination should be deferred until the acute illness has improved.

Pregnancy is not a contraindication to influenza vaccine nor is immunosuppression. In fact, pregnant women and immunocompromised people, including those with HIV infection, SHOULD be vaccinated.

A frequent question is whether a history of Guillain Barre´ syndrome is a contraindication to influenza vaccine. Guillian Barre´ syndrome, or GBS, is not an automatic contraindication for influenza vaccination. The association between influenza vaccine and GBS is discussed in detail in the influenza ACIP statement. You should be familiar with it. The bottom line is that in most cases the benefit of influenza vaccine outweighs the risk of a second occurrence of GBS in people at high risk of complications from influenza.

A few final notes on influenza vaccine. The 2003- 2004 influenza vaccine formulation includes: A/New Caledonia/20/99, the H1N1 strain, A/Panama/2007/99, the H3N2 strain, and B/Hong Kong/330/2001. If these strains seem familiar to you, it’s because they are the same strains that were in the 2002- 2003 formulation.

The FDA does not recommend the use of any vaccine beyond

its expiration date. ALL of the 2002- 2003 influenza vaccine expires on June 30, 2003 and should NOT be used after that date. You should NEVER administer expired vaccine. Also, even though this year's strains are the same as last year's strains, you still need to receive your annual dose this fall.

Health care providers who have not yet placed influenza vaccine orders should do so as soon as possible. This will assure that you get all the vaccine you need for your practice, and receive at least part of your supply early in the season.

And, finally, good news. Medicare's 2003 vaccine administration rate allowance has increased by 94% since 2002 for an average of $7.72. The rates range from $534 to $10.98 depending on geographic location.

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